

NON-PUBLIC?: N
ACCESSION #: 9501250057
LICENSEE EVENT REPORT (LER)

FACILITY NAME: Joseph M. Farley Nuclear Plant-Unit 2 PAGE: 1 OF 4

DOCKET NUMBER: 05000364

TITLE: Reactor Trip Due To Turbine Control System Intermittent
Failure
EVENT DATE: 12/18/94 LER #: 94-003-00 REPORT DATE: 01/17/95

OTHER FACILITIES INVOLVED: N/A DOCKET NO: 05000

OPERATING MODE: 1 POWER LEVEL: 100

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR
SECTION:
50.73(a)(2)(iv)

LICENSEE CONTACT FOR THIS LER:
NAME: R.D. Hill, General Manager-Nuclear TELEPHONE: (205) 899-5156
Plant

COMPONENT FAILURE DESCRIPTION:
CAUSE: B SYSTEM: JJ COMPONENT: DCC MANUFACTURER: W120
B JJ 63 J320
REPORTABLE NPRDS: Y
Y

SUPPLEMENTAL REPORT EXPECTED: NO

ABSTRACT:

At 03:52 on December 18, 1994, with Unit 2 in Mode 1 operating at 100 percent reactor power, the reactor tripped due to low-low level in the 2C steam generator (SG). The low-low SG level occurred as a result of a load transient initiated by the digital electro-hydraulic control (DEHC) system closing all four governor valves. The rapid load reduction resulted in SG level shrink sufficient enough to generate a reactor trip signal.

A root cause investigation which included a review of the DEHC system and plant computer data attributed the event to an intermittent failure in the 63AST-2 auto stop oil pressure switch circuit that provides an electrical input to the DEHC governor control auto stop latch circuitry.

The suspect pressure switch was replaced. Additionally, a temporary recorder was installed to monitor auto stop oil pressure. The unit was returned to power operation on 12/19/94 at 1806.

Subsequently, on December 25, 1994, with Unit 2 in mode 1 operating at 100 percent power, the reactor tripped due to a turbine trip caused by an intermittent failure of the DEHC overspeed protection circuitry. A root cause investigation of this subsequent event indicated that although the sequence of events of the referenced reactor trips were different, both reactor trips were most likely caused by an intermittent DEHC system processor failure. Subsequently, six cards associated with the DEHC system have been replaced and forwarded to the vendor for evaluation.

END OF ABSTRACT

TEXT PAGE 2 OF 4

Plant and System Identification

Westinghouse -- Pressurized Water Reactor

Energy Industry Identification System codes are identified in the text as XX!.

Description of Event

At 03:52 on December 18, 1994, with Unit 2 in Mode 1 operating at 100 percent reactor power, the reactor tripped due to low-low level in the 2C steam generator (SG). The low-low SG level occurred as a result of a load transient initiated by the digital electro-hydraulic control (DEHC) system JJ! closing all four governor valves. The rapid load reduction resulted in SG level shrink sufficient enough to generate a reactor trip signal.

Cause of Event

A root cause investigation which included a review of DEHC system and plant computer data attributed the event to an intermittent failure in the 63AST-2 auto stop oil pressure switch 63! circuit. This circuit provides an electrical input to three individual logic cards in the DEHC governor control auto stop latch circuitry. A two out of three logic condition from these cards is required to initiate a governor valve closure sequence on loss of auto stop oil. There were no apparent indications of a DEH processor DCC! failure. The suspect pressure switch was replaced. Additionally, a temporary recorder was installed to monitor the auto stop oil pressure. Subsequent to startup, additional bench testing of the suspect pressure switch was unable to re-create the

apparent intermittent failure.

Subsequently, on December 25, 1994, with the Unit 2 reactor in mode 1 operating at 100 percent power, the reactor tripped due to a turbine trip. This turbine trip was caused by an intermittent failure of the DEHC overspeed protection (OPC) circuitry. It is apparent that the primary OPC controller (DROP 2) failed in a manner which prevented the redundant OPC controller (DROP 52) from assuming control of the DEHC overspeed protection function within the required time frame. This resulted in a turbine trip due to a loss of both OPC controllers. Although the sequence of events of the reactor trips on 12/18/94 and 12/25/94 were different, the DEHC processor data in conjunction with the proper response of auto stop oil pressure (as indicated by the temporary recorder) indicates that both reactor trips were most likely caused by an intermittent failure of a DEHC system processor. Subsequently, six cards associated with the DEHC system (three associated with the suspect processor) have been replaced and forwarded to the vendor for evaluation.

TEXT PAGE 3 OF 4

There was no Solid State Protection System, DEH control system, or other work in progress that could have contributed to this event.

Safety Assessment

This event is reportable because of the actuation of the reactor protection system.

All systems operated as designed with the exception of the Source Range Nuclear Instruments. These instruments failed to automatically energize because Intermediate Range Nuclear Instrument N-36 did not go below 1.0 E-10 amps due to compensating voltage being out of adjustment.

This event would not have been more severe if it had occurred under different operating conditions.

Corrective Action

A root cause analysis investigation was performed for the referenced reactor trips.

The suspect pressure switch was replaced.

The Electro-Hydraulic fluid system was inspected for leakage and no leakage was evident.

The electrical circuits from the auto stop oil pressure switch to the DEH logic cards were checked and found in satisfactory condition.

Presently, a study is underway to determine if the pressure switch and associated circuitry could be modified to provide redundant pressure indications to the DEH control system.

Following the December 18, 1994 reactor trip, a temporary recorder was installed to monitor the auto stop oil pressure for any transients that might cause this type of event. Auto stop oil pressure responded per design during the subsequent reactor trip on December 25, 1994.

Following the December 25, 1994 reactor trip, data analysis determined that there were no apparent malfunctions internal to DROP 52. Subsequently, DROP 52 was placed in the primary OPC controller status. Following the replacement of cards associated with DROP 2, it was placed in the redundant OPC controller status. These cards have been forwarded to the vendor for evaluation.

TEXT PAGE 4 OF 4

An independent review team has been assembled to conduct a review of the information surrounding this event and the December 25, 1994 event.

Additional Information

The following LER's involved reactor trips associated with DEHC system failures:

1. Manual reactor trip due to governor valve closure caused by a degraded DC voltage output from the primary Operator Auto Controller power supply in the main turbine DEHC system and a failure of the circuitry which should have transferred the power supply: LER 91-010, Unit One.
2. Reactor trip caused by a voltage transient on the DEHC inverter: LER 89-015, Unit Two.

On January 13, 1995, with the Unit 1 reactor operating at 100 percent power the reactor tripped due to a turbine trip. The turbine trip was caused by a failure in the Unit 1 DEHC system. A review of this trip and its relationship to the Unit 2 trips on December 18 and 25 is being conducted at the time of this LER submission.

ATTACHMENT TO 9501250057 PAGE 1 OF 1

Southern Nuclear Operating Company
Post office Box 1295
Birmingham, Alabama 35201
Telephone (205) 868-5131

Dave Morey Southern Nuclear Operating Company
Vice President the southern electric system
Farley Project

January 17, 1995

Docket No.: 50-364 10 CFR 50.73

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555

Joseph M. Farley Nuclear Plant - Unit 2
Licensee Event Report No. 94-003-00
Reactor Trip Due To Turbine Control System Intermittent Failure

Gentlemen:

Joseph M. Farley Nuclear Plant Licensee Event Report No. 94-003-00 is being submitted 'in accordance with 10 CFR 50.73. If you have any questions, please advise.

Respectfully submitted,

Dave Morey

MGE/clt:lertbfai.doc

Enclosure

cc: Mr. S. D. Ebnetter
Mr. B. L. Siegel
Mr. T. M. Ross

*** END OF DOCUMENT ***
